

REMARKS/ARGUMENTS

The claims are 23-38. The claims have been amended to improve their form or to better define the invention. Support for the claims may be found, *inter alia*, at the last two paragraphs of page 8, and the first full paragraph of page 9. Reconsideration is expressly requested.

Claims 23-38 were rejected under 35 U.S.C. 112, second paragraph as being indefinite for the reasons set forth on page 2 of the Office Action. In response, Applicant has amended the claims to improve their form in order to provide antecedent basis for terms recited in the claims as requested by the Examiner. It is respectfully submitted that all currently pending claims fully comply with 35 U.S.C. 112, second paragraph, and Applicant respectfully requests that the rejection on that basis be withdrawn.

Claims 23-28, 34-35 and 38 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Puide et al. U.S. Patent No. 6,450,739* in view of *Asai JP 1-309718*. The remaining claims 29, 30, 31, 36 and 37 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Puide et al.* in view of *Riviere et al. U.S.*

Patent No: 5,598,731. Essentially, the Examiner's position was that *Puide et al.* discloses the method and device recited in the claims except for features which were said to be shown by either *Asai* or *Riviere et al.*

In response, Applicant has amended claims 23 and 33 to better define the invention and respectfully traverses the Examiner's rejection for the following reasons.

As set forth in claims 23 and 33 as amended, Applicant's invention provides a method and a device for producing a bar-shaped hard metal tool comprising at least two materials of different hardness, where the first material has the lower hardness and forms a bar-shaped support for the second, harder material.

As recited in claim 23 as amended, the first material is provided with a first extrusion tool in the form of a plastic first mass flow, the second material is provided with a second extrusion tool similarly in the form of a plastic second mass flow, and the second material is fed to the first extrusion tool by way of a channel connecting the two extrusion tools and forced within the first extrusion tool into the first mass flow. A

common plastic mass flow of the first and second material is issued from the first extrusion tool as a bar-shaped body in which the first material forms a bar-shaped support for the second material, and the bar-shaped body issued from the first extrusion tool is further processed to form a hard metal tool. Output signals of a sensor are coupled to a control unit, and the control unit generates control signals such that volumes of the first and second mass flows are controlled individually.

As set forth in claim 33 as amended, the device includes a first extrusion tool within which the first material can be pressed in the form of a plastic first mass flow in a direction towards the nozzle mouthpiece thereof, a second extrusion tool by means of which the second material is provided in the form of a plastic second mass flow, a channel connecting the two extrusion tools, a further nozzle by which the second material can be forced into the first material, a control unit provided for setting volume flows of the materials, and a sensor connected with the control unit. Output signals of the sensor are coupled to the control unit, and the control unit generates control signals such that volumes of the first and second mass flows are controlled individually.

In this way, Applicant's invention provides a method and a device which produces a hard metal tool including at least two materials of different hardness, where the material with the lower hardness (first material) forms a bar-shaped support for the second harder material, without requiring the introduction of grooves into the base body, and makes it possible to introduce the second material not only into the edge regions but also into the inner regions of the first material so that the second material can extend substantially in the axial direction of the bar-shaped tool and frequent regrinding of the tool can be readily carried out, which significantly prolongs the service life of the tool.

As more specifically recited in claims 28, Applicant's invention provides a method of producing a bar-shaped hard metal tool in which the first and second mass flows have respective speeds undertaken by respective control of the movement of a piston in dependence on the output signals of the sensor. As more specifically recited in claim 31, control of the movement of the piston and/or the valve is undertaken in such a manner that forcing of the second material into the first mass flow takes place only within predetermined time intervals in such a manner that the second material is forced merely into a front region of

the cylindrical body leaving the first extrusion tool. In this way, further cost savings are possible by taking into account that the rear region of the finished drilling tool at no time forms the cutting region as discussed at page 9, first paragraph of the specification.

None of the cited references discloses or suggests a method of producing a bar-shaped, hard metal tool or a device for carrying out this method in which volumes of the first and second mass flow are set individually.

The primary reference to *Puide et al.* discloses a method and apparatus for forming a hard metal tool comprising a first material 13 of a lower hardness and a second core material 12 of harder material whereby the first material 13 is provided within a first extrusion chamber 52 of an extrusion tool 50 and the second material 12 is provided within a second extrusion chamber 51 of the same extrusion tool 50 and the second material is fed through a nozzle 53 that forces the core material into a common plastic mass flow with the first material in a nozzle 54. The first and second material are then forced through a die. However, there is no disclosure or suggestion of Applicant's process and device as recited in claims 23 and 33 as amended in

which output signals of a sensor are coupled to a control unit, and the control unit generates control signals such that volumes of the first and second mass flows are controlled individually. In particular, there is no disclosure or suggestion of controlling the speed of a mass flow of the materials by a sensor as more specifically recited in claims 28 and 31.

The defects and deficiencies of the primary reference to *Puide et al.* are nowhere remedied by the secondary references to *Asai* and *Riviere et al.* *Asai* simply discloses a speed sensor 15 and a hydraulic pressure detector 16, in which the output signals of a speed sensor 15 and a hydraulic pressure detector 16 are fed to a processing circuit 17. The output signals of the processing circuit 17 control a servo motor 14 such that the flow rate of pump 11 is controlled and the speed of a ram 5 or the extrusion speed are kept at a set value. There is no disclosure or suggestion of setting the volumes of a first and second mass flows individually, for example to force a second (and/or third) material into a first material only in the front half of the drilling tool to save material costs on the more expensive extremely hard materials required for the cutting region of the finished drilling tool.

*Rivière et al.* simply teaches an apparatus for continuously extruding shaped articles that includes a chamber for holding frictionally extruded material received from the extrusion source having outlet conduits 44, 45 that contain sealing means 46, 47 with an open position that allows extruded material to pass through to die chambers 10, 10a coupled to the outlet conduits and a closed position that blocks egress from the holding chambers. There is no disclosure or suggestion of setting the volumes of first and second mass flow individually by having output signals of a sensor coupled to a control unit which generates control signals for controlling the volumes of the first and second mass flows individually. Thus, it is respectfully submitted that claims 23 and 33 as amended are patentable over the cited references together with claims 24-32 and 34-38, which depend directly or indirectly on claims 23 and 33 as amended, respectively.

Applicant would also like to advise the Examiner that European Patent (EP 1 581 354 B1) has already been granted on the International Application in this case, and a German Patent (DE 103 00 283 B3) has also been granted on the German Priority Application. A copy of EP 1 581 354 B1 and DE 103 00 283 B3 are enclosed.

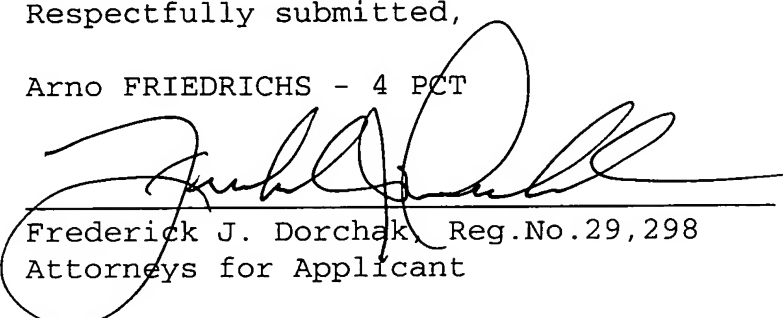
In summary, claims 23-38 have been amended. In view of the foregoing, it is respectfully requested that the claims be allowed and that this case be passed to issue.

Applicant also submits herewith a Supplemental Information Disclosure Statement.

Respectfully submitted,

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Enclosures: Copy of EP 1 581 354 B1 and DE 103 00 283 B3  
Supplemental Information Disclosure Statement

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on September 13, 2006.



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